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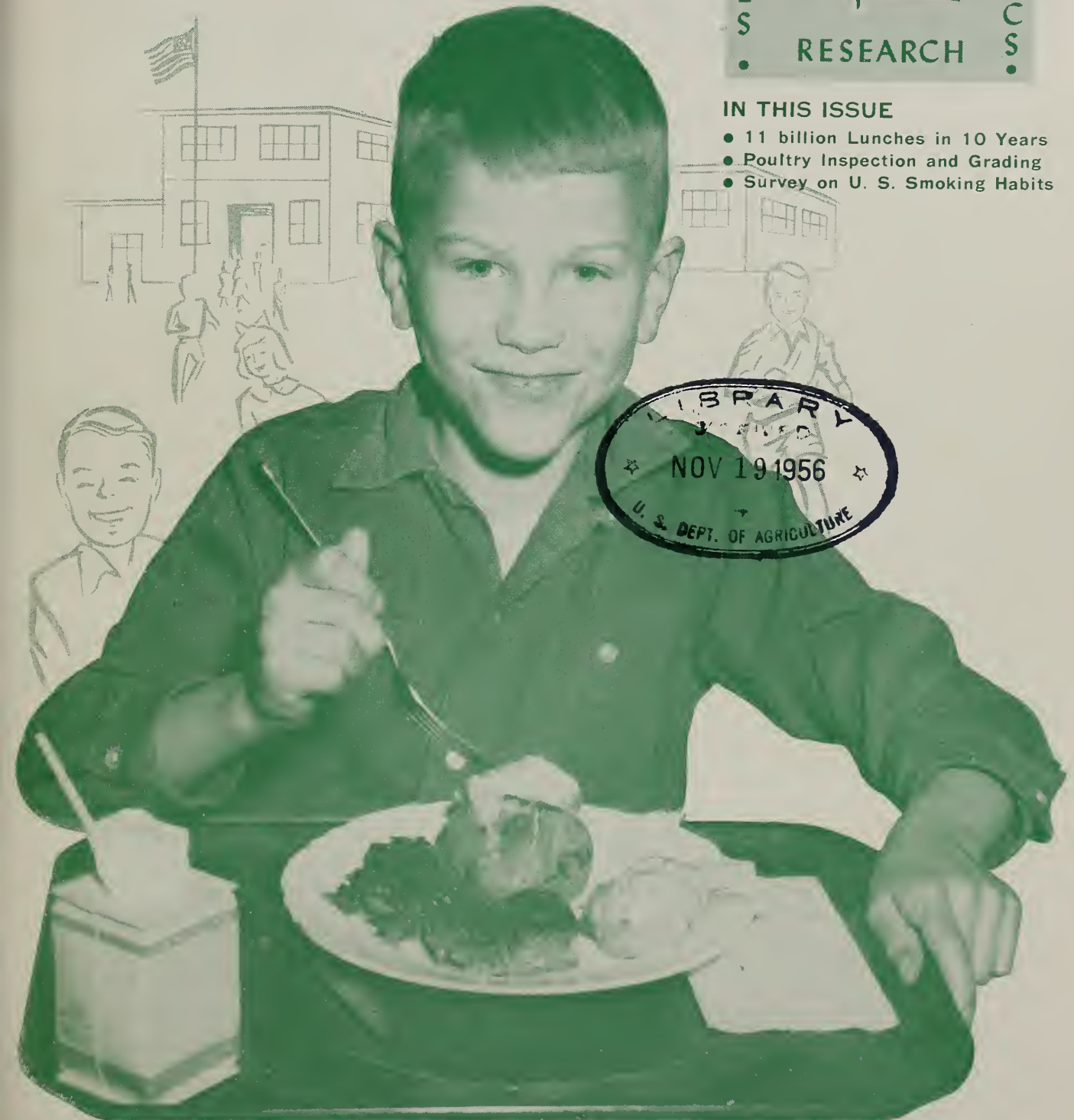
OCTOBER 1956

AGRICULTURAL MARKETING



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- Poultry Inspection and Grading
- Survey on U. S. Smoking Habits



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Editor (acting) Milton Hoffman

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LABOR IN MARKETING FARM FOOD PRODUCTS



By Forrest E. Scott

A much larger volume of products—more marketing workers—but also more output per worker in the marketing system. That's been the trend in food marketing for 25 years, and it looks like it will continue.

This increase in the volume of products handled per worker has enabled the food marketing system to handle today, with only 50 percent more workers, a 65-percent larger volume of food products than it did in 1929.

Much of this increase may be attributed to improved marketing facilities and practices. Marketing research, public and private, has contributed substantially to the development of these improved methods and facilities.

Since a lot of the marketing workers' time is spent in picking up, moving, and putting products into place, considerable research has been focused on this phase of food marketing.

More efficient methods have been devised for loading farm products in trucks and railroad cars, unloading at processing plants, storing in warehouses, receiving at retail stores and arranging on display shelves. New processing plants, warehouses, and stores have been built and old ones remodeled to accommodate modern handling methods. There has been extensive use of forklift trucks, palletized loads, and conveyors.

Also, the food marketing industry has made extensive application of assembly-line procedures and continuous processes of manufacture. Newly developed automatic equipment has reduced the need for machine operators and for human control of some processes.

But better facilities and improved work methods are not the only reasons for an increase in the quantity of products marketed per worker. Some services have been eliminated or reduced.

Self-service has almost replaced clerk-service in grocery stores. Delivery and credit services have been eliminated in many retail food stores. Most milk companies have adopted every-other-day home delivery service, others deliver milk three times a week.

By reducing some services and increasing efficiency in performing others, the food marketing system has been able to handle an increased volume of products with a somewhat smaller increase in personnel.

The number of marketing workers increased from 3,400,000 (on a fulltime equivalent basis) in 1929 to 5,100,000 in 1955. All branches of the industry shared in the increase. Significant decreases occurred only in the early 1930's and during World War II.

Included in these 5,100,000 persons now assembling, processing, and distributing food products are salaried and wage employees and proprietors of unincorporated marketing firms and other family workers who do not receive money wages or salaries.

About three-fifths of these workers are engaged in retailing, about a fourth in processing, and the other 15 percent in local assembly, wholesaling, and transportation. Slightly more than two-fifths of those in retailing are in restaurants and other eating places.

Expansion in the volume of food products sold by the farmer accounts for most of the increased number of food marketing workers. Another factor has been an increase in the number of operations per unit of product performed by the marketing system.

Today more grading, sorting, transportation, refrigeration, processing, and packaging operations are performed. Each additional operation generally increases the labor required.

Marketing activities have been increased by the sale of more services to consumers along with the food they buy. In recent years, more food has been sold in the form of meals in eating places. More of the preparation of food has been shifted from the kitchen to the processing plant by increasing sales of food in prepared or partially prepared form.

The increase in output per marketing worker, made possible by improved methods and facilities, has helped to hold down the cost of all these operations.

POULTRY INSPECTION AND GRADING

By Dr. Roy E. Willie and Henry G. Hamann

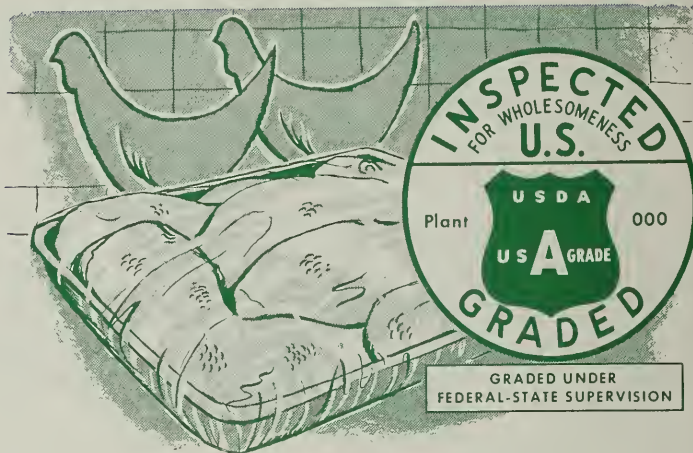
If you see the USDA seal of inspection and grading on the poultry you buy, you know it's got to be good. The poultry has been checked by Agricultural Marketing Service inspectors and graders for wholesomeness and for quality. And the poultry has met certain rigid sanitary requirements as well.

A "yardstick" with which to measure the quality of the product, the USDA seal provides producers and processors with a useful marketing tool. It provides the consumer with the assurance of fine poultry.

Inaugurated almost 30 years ago, the program of inspection and standardization has grown steadily. It now covers almost one-fourth of all poultry sold off the farms. It includes almost all of the turkeys.

At the beginning, the inspection and grading programs were slow to take hold. More recently, the demand for the Government stamp of approval has grown.

U. S. Department of Agriculture veterinarian examines eviscerated turkeys at one of the 295 poultry plants under Federal inspection.



In 1951, about 150 plants used the service. Today, this number has doubled. Another 125 plants have applications pending with the Poultry Division of AMS.

Many of these new applicants are anticipating compulsory inspection and grading legislation. This year, 14 bills were proposed in Congress for compulsory inspection. Three of them were in the Senate, 11 in the House. Many States now require inspection as a prerequisite for poultry shipped into these States.

At present, use of the inspection and grading program is voluntary. The plant pays a fee on the basis of the amount of poultry inspected or graded.

Of the 425 Federal poultry inspectors, almost 300 are graduates of veterinary medicine. All are given special training. All must qualify not only in ability but in character and personal habits.

The inspector places the USDA "Inspected for Wholesomeness" seal only on poultry that shows no evidence of conditions that might make the bird or its edible organs unfit for food. Ready-to-cook poultry must be fully drawn or eviscerated at a processing plant where the inspector examines the internal organs at the same time he inspects each bird inside and out.

The circular seal of USDA inspection is an assurance of a wholesome product processed under sanitary conditions. It does not, however, refer to quality. Quality ratings are given by AMS graders. Poultry meeting certain standards bears the shield of the Federal grading service. Only poultry which has been inspected can qualify for the grade mark.

The grade names now used for dressed and ready-to-cook poultry (including turkeys) are U. S. Grade A, B, and C. In grading live poultry, these ratings are sometimes U. S. 1, 2, or 3. The numerical ratings correspond to the A, B, and C markings. Individual grade marks may not be placed on New York-dressed carcasses.

These grades were decided by USDA officials in co-

operation with producers, processors, and consumers, and other interested State and government agencies.

In judging quality, the grader considers the general condition and cleanliness of each bird. He takes note of the shape or conformation of the bird, amount of fleshing or "meatiness," amount of fat distributed in and under the skin, and the absence or extent of bruises, tears, discolorations, and pinfeathers.

Minimum standards for each of these factors have been set up for each of the three grades. A bird that falls short of the standards for any factor must be placed in a lower grade.

These official grades provide processors and distributors with a uniform measurement of variations in quality and condition of the poultry they handle.

Before USDA grades became widely adopted, many of the terms and grade classifications used locally were not recognized, in many instances, outside of a particular area. As a result, pricing of poultry was based largely on opinions of sellers or buyers, depending on market conditions and variations in grades themselves.

USDA-established grades have helped to eliminate this confusion. Not only do they provide for a more orderly marketing system, but also they contribute to an expansion of market outlets.

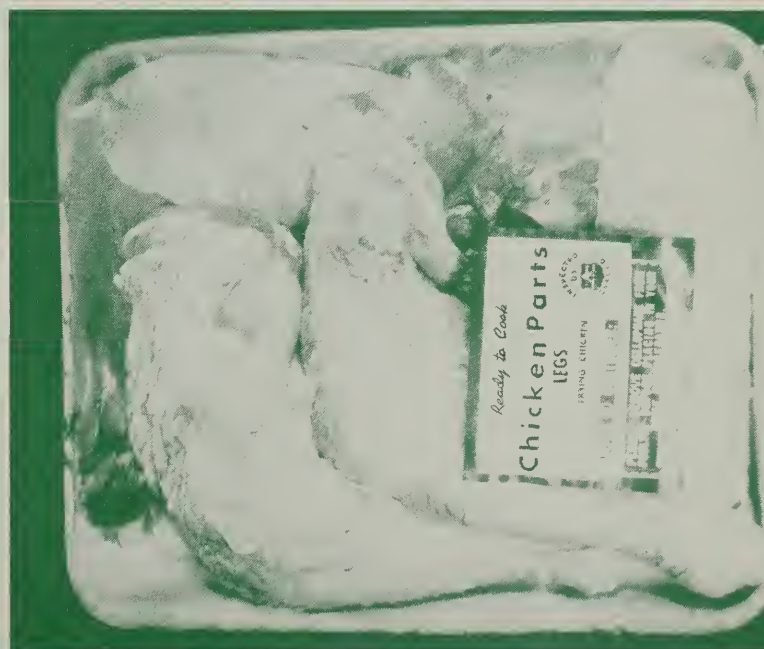
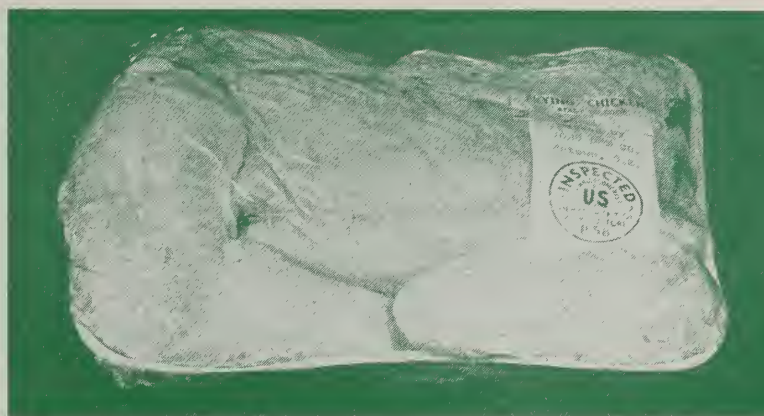
Through the process of inspection and grading, producers and handlers have been able to develop more and bigger markets for poultry. One of the greatest advancements has been the services provided in connection with merchandising eviscerated poultry.

Since 1944, when USDA grades were issued for eviscerated Federally inspected chickens and turkeys, there has been a rapid expansion in merchandising ready-to-cook poultry. The program is especially appropriate in the fast-growing area of frozen poultry.

Here, too, official grades provide a basis for merchandising contracts, reporting market transactions, for appraising stocks, for sorting and packing by producers and processors to meet market requirements.

In addition to increasing domestic markets for poultry products, the inspection process has opened up foreign markets to the industry. The services of inspection of poultry for wholesomeness meet the requirements of many foreign countries who accept our export certificates as evidence of this inspection.

The amount of dressed poultry, officially graded, increased from 24,211 pounds in 1927 to 306,724,900 pounds in the fiscal year 1955. Officially graded turkeys increased from 22,500 pounds in 1928 to 310,683,443 pounds. And eviscerated poultry, prepared under Federal inspection for wholesomeness, rose from 232,254 pounds to 1,200,000,000 pounds.



Inspected and graded poultry appears on the market in a variety of dresses. At the top, a whole ready-to-eat chicken bears the USDA inspection seal. The frozen package of chicken breasts (center) also displays an inspection mark. Below, the combined seal of inspection and grading is clearly shown on tray-packed chicken legs. In addition to whole and cut-up poultry—fresh and frozen—canned poultry is also government inspected.

Using Aeration Systems to FUMIGATE GRAIN

By Randall Latta



Marketing research seeking better ways to fumigate stored grain is looking hopefully toward aeration.

This is one of the methods of fumigating currently under study by entomologists and engineers at the Manhattan (Kansas) Stored Grain Insects Laboratory of the Agricultural Marketing Service.

Researchers hope through these tests to lower the cost of fumigating, to increase its efficiency, and to learn how to use fumigants that do not penetrate grains well by natural diffusion.

Aeration systems (AGRICULTURAL MARKETING, Aug.-Sept. 1956) are used to condition grain by moving air through it. Early tests demonstrated that the volume of air used in aeration can effectively distribute fumigants throughout the grain. These air-flow rates fall in a range that permits 1 complete air change in 10 to 30 minutes.

Researchers have been using the aeration systems in two ways. In the "recirculation" method, the exhaust of the fan in the system is recirculated through the grain from top to bottom. This is accomplished by a return duct in such structures as grain elevators, steel tanks, and "tight" flat storages. In other instances, like the hold of a ship, the exhaust can be diverted without adding a duct.

In one case, two tanks were connected and the vapors were pulled downward through one tank and upward through the second tank.

A second method, labeled "forced distribution," was initiated to eliminate the costs of ducts. This is for use in structures too "loose" for the recirculation method, and to keep the fumigant vapors in the top

layers of the grain where they are needed. In this method the usual direction of the blower is reversed so that the air flow is upward from the bottom.

Volatile fumigants, such as methyl bromide, can be effectively distributed this way throughout the grain with very little wastage. The so-called liquid fumigants can also be used in this method. These are applied to the grain surface in liquid form and the vapors are allowed to settle by gravity. After the vapors settle out of the surface layer, they can be pushed back to the surface where insects usually congregate.

The researchers have been using thermal-conductivity gas analyzers to measure quickly concentrations of fumigant vapors at various locations in the grain mass and storage structures.

Hollow probes with perforated tips are inserted into the grain to desired locations. The probes are connected to the gas analyzer by $\frac{1}{4}$ -inch plastic tubing. The unit contains a tiny pump which draws a gas sample from the probe tip and passes it through the instrument.

A single operator outside a storage structure under fumigation can determine and chart the fumigant concentrations at a number of selected locations within.

When the desired exposure period is over, the vapors can be removed easily by a few hours' aeration. This permits use of fumigants that would injure the grain if the vapors were left to dissipate unaided, or those that must be controlled to avoid undesirable residues in the commodity.

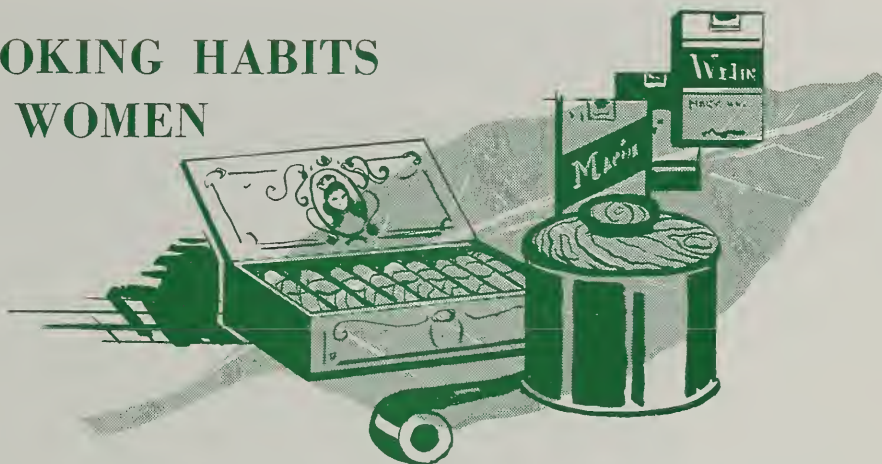
Dr. Richard T. Cotton, AMS entomologist and winner of one of the National Civil Service League's awards, uses a gas analyzer to determine the fumigant concentrations in a storage tank.



SOME FACTS ON SMOKING HABITS OF MEN AND WOMEN

National Survey of Men and Women Smokers Gives Proportions of People Who Smoke Cigarettes Cigars, and Pipes

*By Arthur G. Conover and
Seymour M. Sackrin*



Who smokes? What do they smoke? At what age do they smoke? In what income bracket? How much do they smoke?

A recent survey of the smoking habits of men and women 18 years and over gives the answers to these questions. And these answers give tobacco producers, warehousemen, leaf dealers, manufacturers, and distributors a pretty good picture of the U. S. smoker.

The Agricultural Marketing Service is currently analyzing data from surveys made by the Bureau of the Census. A few of the findings thus far are:

- ◆ More than half of the male population over 18 and about a fourth of the women over that age smoke cigarettes regularly.
- ◆ Only 6 percent of all males over 18 smoke cigars every day but an additional 16 percent smoke them occasionally.
- ◆ Regular pipe smokers number about 8 percent of all males over 18 who have incomes, and over 11 percent of those who have no incomes. About 26 percent of those over 65 years and not having incomes are regular pipe smokers.
- ◆ A majority of both men and women who smoke cigarettes regularly smoke 10 to 20 daily.
- ◆ Cigarette smokers who smoke more than a pack a day are more numerous among smokers who have incomes over \$4,000 a year. The proportion of over-a-pack-a-day smokers is lower among those with an income of less than \$1,000.
- ◆ Regular cigar smokers appear to be only a little less numerous among lower than higher income males but the highest proportion occurs among males receiving \$7,000 or more a year.

These are the people who contribute much of the \$5,500,000,000 spent annually on tobacco products. Tobacco manufacturers direct about \$90,000,000 worth of advertising a year towards these and potential smokers. And because of these smokers the Govern-

ment, 42 States, and many local governments net about \$2,100,000,000 in taxes levied on tobacco products.

Incomes makes a considerable difference in the smoking habits of men who smoke cigarettes regularly. A much larger proportion of men who have money income smoke cigarettes regularly than those who have no income.

For women, the proportion is about the same for those who do and do not have incomes. Many of these "nonincome" women, however, are married and share the purchasing power of their husbands' incomes.

Both men and women in the intermediate age group of 25-54 who smoke cigarettes regularly do so more heavily than younger or older smokers.

Likewise, cigarette consumption increases as incomes increase. The proportion of men smoking more than a pack a day continues to rise until incomes reach \$4,000 to \$5,000. It is significantly lower among men with less than \$1,000 a year income.

The number of cigar smokers appears to depend more on the age of the individual than on his income. The proportion of regular cigar smokers increases—regardless of income—with the age bracket. Only 1 percent of those 18-24 years smoke cigars, but 9 percent of those 55 and over smoke them.

Occasional smokers account for nearly 75 percent of all cigar smokers. But many of these are regular smokers of cigarettes or pipes. However, the occasional cigar smokers probably account for a good third of the total cigar consumption.

Pipe smokers are most numerous among the non-income and low-income brackets. Also, low-income pipe smokers smoke more than pipe smokers in higher income brackets.

There is a sizable number of men who smoke a pipe once in a while—though not every day. In fact, these occasional pipe smokers are more numerous than the regular pipe smokers.

Progress Report on National School Lunch Program

by Phil Fleming

1947
6,016,129

1956
10,568,726

Children Participating

FARMERS and other members of the agricultural marketing community, as parents of children participating in the National School Lunch Program, will immediately recognize the value of the first of the two-fold purposes of the program, improved health of children.

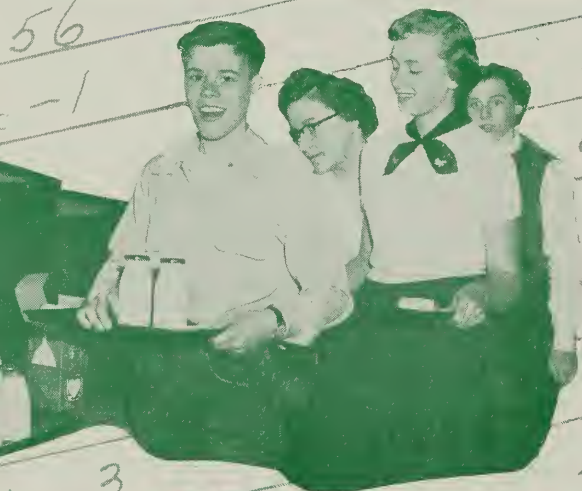
But the second purpose of the school lunch program, increased consumption of farm products, is also important to the farmer as a producer and to the agricultural marketer who stores, transports, processes, wholesales, or retails agricultural commodities.

The National School Lunch Program completed its tenth year of operation in June 1956. This is the story of those 10 years. As the illustrations show, on the top of this page and page 9, it is a story of growth.

The most satisfying feature of that growth has been the continuing, year-to-year gain in the number of children participating. During the past school year, the number of children participating climbed to the new record high of nearly 11 million.

In its 10 years of operation, the children taking part in the school lunch program have eaten a grand total of about 10.8 billion complete meals. These lunches have used a total of about 18 billion pounds of food. That's a tremendous amount of food—enough food, if it were put to that use, to feed everyone in this country, at their normal rate of food consumption, every meal for some 22 days.

Another, more immediate way to consider the importance of school lunches in agricultural marketing is to consider what would happen if all the cooks in the program schools should decide to serve a certain food on the same day. If they were to serve a fruit or a vegetable, for example, it would take a full 135 carlots





of the food, some 5 million pounds, to provide the amount needed to supply the demand arising from just this one source.

Most of the food is purchased by the individual schools from local wholesalers, retailers, and producers. During the past year, about 75 percent of all food used in the lunches was bought from local suppliers.

The National School Lunch Program thus is expanding markets for food in thousands of communities all over the country. It is accomplishing that expansion largely through the regular channels of trade. During the past year, local school officials spent a total of about \$350,000,000 in buying foods through local suppliers.

The National School Lunch Program is administered nationally by the Food Distribution Division of USDA's Agricultural Marketing Service, leading a cooperative Federal-State-local team that has proved its administrative efficiency in this decade of operation.

The State's educational agency (its exact name varies among the States) is responsible for administration within the State. It selects the schools for participation in the program, makes cash payments to schools from funds advanced by AMS, and supervises lunchroom operations in the individual schools.

In these individual schools, the program is operated by local school officials. Frequently, they are given important help by community groups—service clubs, parent-teacher associations, and other groups—in starting and maintaining the lunch program.

To be eligible to take part in the National School Lunch Program, a school must agree to three basic program requirements:

- (1) to operate its program on a nonprofit basis,
- (2) to serve meals meeting nutritional standards established by the Agricultural Marketing Service, and
- (3) to offer the lunch at a reduced price or free to children unable to pay the full price.

Most of the money appropriated for operation of the program is apportioned to the States to help to reimburse schools for their local food purchases.

Of the \$100,000,000 appropriated for the 1956–57 school year, \$83,600,000 has been apportioned among the 48 States, the District of Columbia, and the territories and possessions of the United States.

AMS also assists the schools through donations of foods purchased specifically to help meet established meal-type standards. Each year, about \$15,000,000 of the appropriation is used to make large-volume purchases of foods that are good sources of some of the nutrients commonly lacking in children's diets.

Surplus foods are a third important source of food assistance to schools. Nonprofit school lunch programs have first priority on the supply of food the U. S. Department of Agriculture acquires under its price-support and surplus-removal programs.

The kinds and amounts of foods vary from year to year, depending on market conditions. Large quantities of the foods are now being provided to schools.

During the 1955–56 year, schools received about \$102,000,000 worth of surplus foods—including butter, cheese, nonfat dry milk, dry beans, canned and frozen pork, lard, shortening, rice, sweetpotatoes, cabbage, fresh prunes, cornmeal, and wheat flour.

All these foods provide the schools valuable assistance in helping to make possible the service to children of well-balanced, reasonably priced lunches. ■

Processing Costs for SOYBEAN OIL MILLS

An Agricultural Marketing Service research report explains how changing the size of soybean oil mills affects the total cost and total revenue per bushel of beans processed. The report is based on a study made by John M. Brewster and Julia A. Mitchell, AMS agricultural economists, and Stanley P. Clark, associate engineer, Texas Engineering Experiment Station. The researchers report on some of their findings.

An industrywide increase in the size of soybean plants would result in appreciable savings in soybean processing costs. A savings of 9 cents per bushel, or \$3 per ton, could be gained by expanding a solvent mill from 50 to 1,000 tons of beans processed per day.

A saving of nearly 4 cents per bushel can result by converting a 50-ton mill into one of 100-ton capacity. And a further boost of the 50-ton mill to 400 tons per day showed a 7-cent savings per bushel.

But beyond 400 tons, savings in costs are slight.

These are the facts and figures revealed in a marketing research study made by the Agricultural Marketing Service. The authors compared the efficiencies of different size mills as measured by net revenue per bushel of beans and per dollar of investment.

Using data covering the 3-year period 1951-52 through 1953-54, the authors made an analysis of various size model mills assumed as operating under typical conditions.

Through the use of engineering methods, they

put these model mills on a comparable basis with respect to depreciation, interest, property taxes, and insurance. Operating requirements and practices were checked against actual processing plants.

All the mills in the study were assumed to operate under average conditions. This applied to costs per unit of input, transportation costs of soybeans, the proportions of bulk and bagged meal produced, and f. o. b.-mill returns for oil and meal.

It was also assumed that the model mills operated at normal daily processing rates and for a 12-month season of 330 24-hour working days.

Working with these model mills, the analysts came to several conclusions.

They saw that as the size of the mills increases, meal revenue and total cost per bushel of beans decline in approximately equal amounts. This decline in meal revenue is due to the fact that as mills grow larger they sell a greater proportion of their meal in the general, rather than local, market.

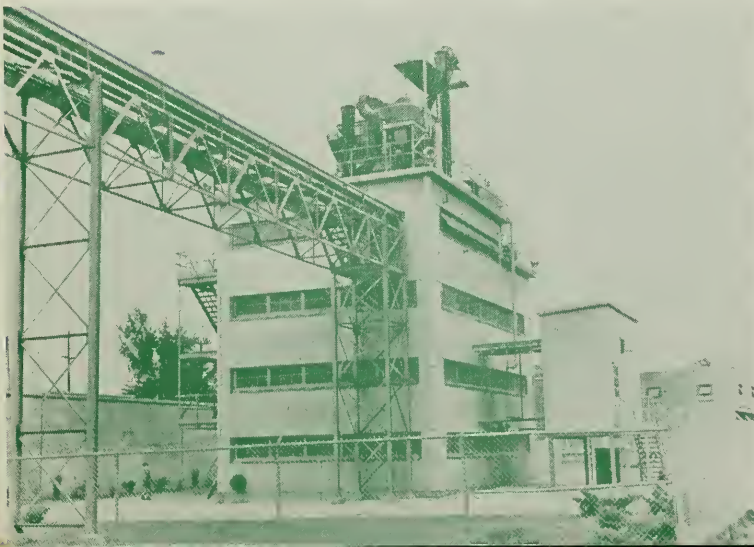
The mill price for meal sold locally is higher than for meal sold in the general market. This is partly because of the freight costs to bring competing meal from other mills and partly because local demand is primarily for bagged rather than bulk meal.

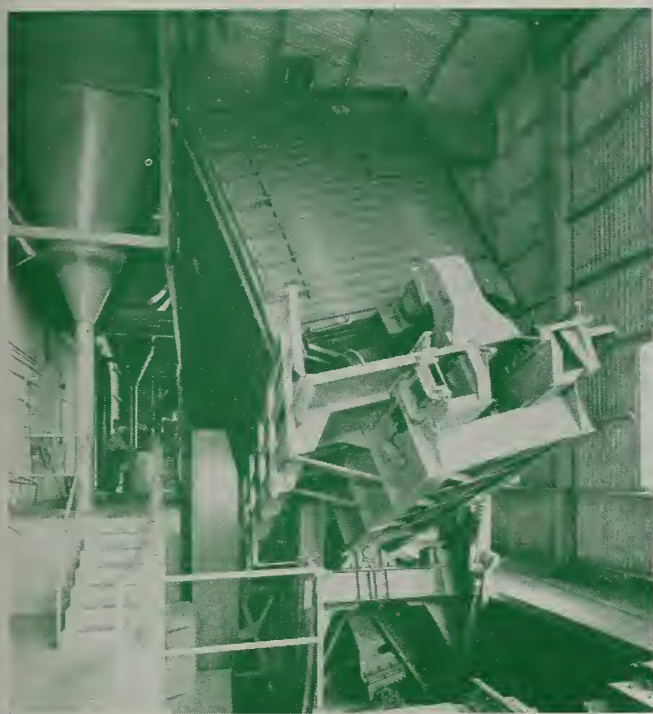
Larger mills, with large amounts of bulk meal to sell, however, must look beyond local markets. And only because of their lower processing costs can they do this profitably.

Also, larger plants can operate at a greater profit than smaller plants because they require less investment per bushel of beans processed.

For example, the difference in profit between a 150- and a 1,000-ton mill was 5.9 cents per dollar of investment. This was equivalent to 2.9 cents per bushel of beans.

Solvent-extraction building.





A boxcar dumper unloading a railroad car in soybean oil mill.

As the size of the mill varied downward from 1,000 tons per day, its differential profit over the 150-ton mill also fell. For the 200-ton mill it was only 0.16 cent per bushel.

This differential profit per dollar of investment is the maximum amount by which a large mill can economically bid up the price of beans over the smaller mill. The higher the basic profit level on which the soybean industry is competing with other industries, the greater is the differential ability of the large mill to pay more for beans.

But no substantial raise in the price of soybeans would result from a reorganization of the industry into fewer but bigger mills. Even an industry composed of only 1,000-ton mills and over could not be expected to raise the price more than 2.9 cents per bushel. And the amount probably would not reach this figure.

Reorganization of the industry into many small-sized mills would result in either a higher price for soybean meal or a lower price for soybeans, or possibly both. Soybean production is highly concentrated relative to the area of the general market for soybean meal where the f.o.b.-mill price is lower than the local market price.

To increase the number of small mills and still maintain their present advantages would require additional local outlets. Such local-market expansion is not possible. Local meal demand in the Soybean Belt is already being largely supplied by local mills.

In addition to this appraisal of the size of mills, the AMS study also compared the economies of small solvent and screw-press mills. Analysis showed that as mill sizes increased to 50-ton capacity, the solvent mill earned more net revenue per bushel of beans and per dollar of investment than the screw-press mill.

At 50-ton capacity, the advantage of the solvent mills was 2.5 cents per dollar of investment. This was equivalent to 1.5 cents per bushel of beans.

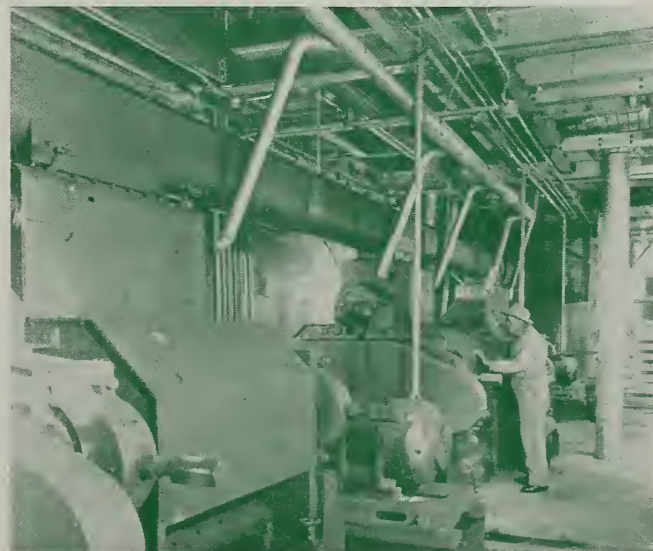
The advantage increased to 5 cents per bushel and over 8 cents per investment dollar as the size of the mill increased to 200 tons per day in size. Beyond this point, the solvent's advantage per bushel remained relatively stable; its advantage per dollar of investment continued to rise, however, to 400 tons per day.

Investment requirements per bushel of beans declined more rapidly for the solvent process than for screw press, especially as the size of the mills increases up to 400 tons per day. After this level, the requirement declines slowly and at about the same rate for both types of mills.

For this reason, the larger the mill size, the greater is the advantage of shifting to solvent mills even though the profit advantage per bushel remains the same.

This explains why the rapid shift of the industry from the screw-press to solvent mills in recent years has been restricted almost entirely to mills of 200 tons per day in size and over. It also shows the general trend in the processing of soybeans—a general conversion to large solvent mills.

A copy of the full report on this study, "Size of Soybean Oil Mills and Returns to Growers," MRR-121, is available from the Marketing Information Division of Agricultural Marketing Service.



Three single-stand flaking rolls installed in a soybean oil mill.



TREE NUTS

Prospects and Trends

By Jules V. Powell

By 1975 the demand for tree nuts will far exceed present supplies, say research specialists of the Agricultural Marketing Service who recently completed a study on marketing trends and prospects.

Population increases alone will assure an annual domestic consumption of over 300 million pounds of shelled nuts in 1975, AMS researchers point out. However, per capita consumption of tree nuts is also expected to increase. This will result from improved methods of marketing and increased consumer education concerning the use of nuts in main course dishes as well as in desserts and confections.

Until recently, the tree nut industry lagged behind other food industries in responding to the packaged convenience trend. Keeping the nut kernels fresh and attractive when displayed at the retail level presented a serious problem. This difficulty—and many others concerning color, flavor, texture, and packaging of shelled nuts—has now been largely overcome.

Also, improved merchandising methods have created a greater interest in using shelled nuts in the home either for out-of-hand eating or for use in the preparation of other foods.

Although the consumption of tree nuts has remained comparatively stable since World War II, data indicate nuts are among the items people buy more of as family incomes rise. So, marketing researchers expect that

an increasing population, plus rising incomes, will result in an increased demand for tree nuts.

With tree nuts, as with most other tree crops, current production depends upon previous plantings. Current demands, which result in increased plantings, boost output only years later.

For example, increased production in the 1930's resulted from plantings made during the 1921-28 period when prices were favorable to nut growers. Similarly, the increased average production in the early 1950's resulted from plantings made during the high price period of World War II.

So, we can expect that a renewed interest in the planting of nut trees now would not materially increase domestic market supplies until the late 1960's. Expected supplies of domestic tree nuts for the next 4 or 5 years must come from trees which are now of bearing or near-bearing age.

Statistics available on the annual production of almonds and walnuts in California show that in 1954 the total acreage of both nuts was lower than in previous years. For both of these tree nuts, the total bearing and nonbearing acreage dropped 11 percent from the record high. Likewise, there were fewer almond and walnut trees planted during the 1952-54 period than during any similar period since 1930 (for almonds) and 1940 (for walnuts).

These figures indicate that there will be no major expansion in the almond and walnut industries in the immediate future, and only slight increases in production due to increased age of current acreage. However, prices for the 1955-56 almond and walnut crops are at a record high. If prices are maintained, an increase in tree plantings can be expected, resulting in increased production in the late 1960's.

While total acreage of both almonds and walnuts has declined in recent years, total production has increased due to better land for plantings, increased size of trees, an increased percentage of heavier bearing varieties and better cultural methods. More efficient marketing practices have also resulted in a larger percentage of the crop being marketed.

Although data concerning the acreage or number of pecan trees are not available, indications are that more pecan trees have been planted. The production of pecans seems to be spreading to States not currently included in crop estimates, and there is an increasing percentage of improved pecans in the total crop.

The pecan industry no longer depends entirely upon wild or seedling trees. Although native trees still form the foundation of the industry in the Southwest, almost half the national pecan production comes from carefully planted groves.

New plantings have been made in Texas and Oklahoma, and in New Mexico, a State which, to date, had not been included in national pecan production figures. Smaller crops, due to poor weather in 1954 and 1955, and favorable grower prices during those years, indicate that pecan production can be expected to increase more than other nut crops.

Filbert production, on the other hand, declined approximately 33 percent in both Oregon and Washington during the 1950-54 period. In both States, the largest declines have been in the number of trees not of bearing age. But the number of bearing trees also dropped. In 1954, only about half as many farms reported growing filberts as in 1950.

This sharp decline in the number of bearing and non-bearing trees indicates that filbert production in the Northwest will continue to decline for the next few years unless prices higher than the 1955 level can be obtained by growers.

While the demand for nuts as a group is expected to increase, demand for the individual nuts depends upon the demand for the products in which they are used and the degree of competition among the nuts for these end uses. For example, nuts in confectionary products.

At the present time, the consumption of tree nuts is small compared with the consumption of peanuts.

During the 1950-52 period, 290 million pounds of peanuts were used annually. This compared with 169 million pounds of tree nuts.

The dominance of peanuts in those areas where they compete with tree nuts is due primarily to price.

Peanuts are much cheaper than tree nuts, although percentagewise peanut prices have increased in recent years much more than prices for tree nuts.

In 1954, the season average grower price for peanuts was \$228 per ton compared with \$564 for pecans, \$498 for almonds, \$350 for walnuts, and \$320 for filberts. The present price differential between peanuts and tree nuts is expected to continue.

Increased consumption of tree nuts can be expected first in those outlets where they are already preferred to peanuts—in the baking industry, in sales to households for home cooking use, and in ice cream manufacturing. However, the greatest potential for tree nut consumption will continue to be in confectionary and salting trades, which even now use the bulk of the tree nuts produced.

While the consumption of nuts in present uses can be expanded, continued marketing research may also develop new outlets or commodities that will further increase the use of tree nuts.

This young lady displays a handful of plump hybrid filberts.



AISLE DISPLAYS AFFECT PRODUCE SALES

By Dale L. Anderson and James S. Toothman

SOMETIMES it doesn't pay to increase produce display space in retail food stores. This is particularly true if display cases block customer traffic and prevent easy access to other produce counters.

In fact, item sales actually increased in a store co-operating in a marketing research study when the management removed 3 small aisle displays from the produce department. The study was another phase of the continuing marketing research by the Transportation and Facilities Branch of AMS to increase the efficiency of food retailing operations.

The authors, marketing specialists, made these findings when they charted traffic patterns and actions of a random group of customers. When the store management removed the aisle counters and displayed the produce elsewhere, customers purchased 16 percent more items. And the time the customers spent in the produce department shopping decreased 12 percent.

These improvements occurred even though counter space was reduced 48 square feet or 10.6 percent of the total display space in the produce department.

In the store situation studied, the use of aisle displays hindered the movement of customers. It prevented traffic from criss-crossing between the two long counters. And, it affected the overall sales of the produce department.

Specifically, it raised a definite question of the desirability of produce "island" displays.

In addition, the study pointed up a rather new technique in studying layout and display problems. Store operators arrange their fixtures by a more or less trial and error method. Subjective assumptions and personal attitudes have influenced their placement.

Often the location of a special, or new, item display is decided by the availability of space. Or it is decided by the area in which space could most easily be created. Usually, the new display has ended up right in the middle of an aisle.

Charting traffic patterns of a random sample of customers can develop an exact measure of customer habits. It is possible to evaluate the relative drawing power of a particular area of a store. Also, operators



can measure the effect of customer traffic and congestion on the sales of a specific store area.

The technique is comparatively simple.

In the study of aisle displays, an observer stationed near the produce weighing station plotted customer paths. He made a random selection of customers for tracking, choosing the next person entering the produce department after the last one observed departed. He observed only one customer at a time.

The path the customer followed was traced on a layout sheet of the department. The observer marked each item purchased with an "x." He also recorded with a stopwatch the time the customer spent in the produce department.

At the end of each observation period, customer tracks were transferred from the individual sheets to a master layout. This resulted in a composite plot of the paths and actions of each group of customers.

Previous AMS studies of a produce department, taken at regular intervals throughout the week, indicated that customer congestion was one of the major factors affecting traffic patterns. Thus, both slack and busy periods were selected for this study.

Twenty customers were traced in each of 3 time periods on Friday, and 30 customers in a late-afternoon period on Tuesday. The same time periods and days were used in the "before" and "after" observations.

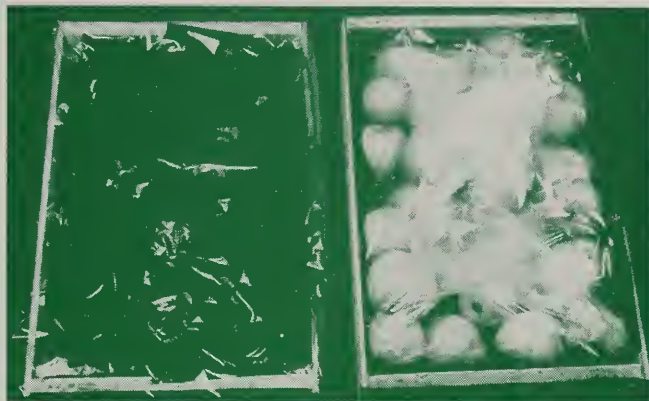
The assortment, quality, and prices of items offered for sale in the produce department remained essentially unchanged during the 2 weeks in which the study was made. With aisle displays in place, customer traffic concentrated along the vegetable-fruit counter.

Removal of the aisle displays allowed greater circulation of customers between the vegetable-fruit counter and the citrus rack opposite. It also increased sales in the citrus section.

A similar spreading out of customer traffic and increased shopping in the citrus-banana section was revealed in each of the four periods studied.

Interestingly enough, removal of the aisle displays caused a much greater increase in items purchased per customer on Friday than on Tuesday. When the "island" displays were not used, 19.7 percent more items were purchased per customers on Friday and only 5.2 percent more on Tuesday.

This suggests that the aisle displays adversely affected the item purchases in direct proportion to the amount of customer traffic and the resultant congestion around the displays. Further, both the Tuesday and Friday observation periods showed that most of the increase "without aisle displays" was accounted for by added sales from the adjacent citrus-banana counter.



SEALED BOX LINERS of 150-gauge polyethylene film offer the best protection for Yellow Newtown apples stored at 40° F., according to a 1-season study made by AMS researchers A. Lloyd Ryall and M. Uota.

Ripening, decay, and scald usually limit the period during which apples can be successfully stored. But with Yellow Newtowns, there is an additional complication if stored near 31° F.—internal browning.

And here's where the polyethylene liners come in.

While control of internal browning cannot be ascribed to the liners, their use slows ripening and materially reduces scald at a storage temperature sufficiently high to minimize browning.

In making this study, Ryall and Uota tested polyethylene films of 100 and 150 gauge, both with and without oiled wraps, as well as paper liners with and without wraps. Fruit packed in the film and paper liners were held at 31° F. and 40° F. for 185 days, then at room temperatures for 2 days.

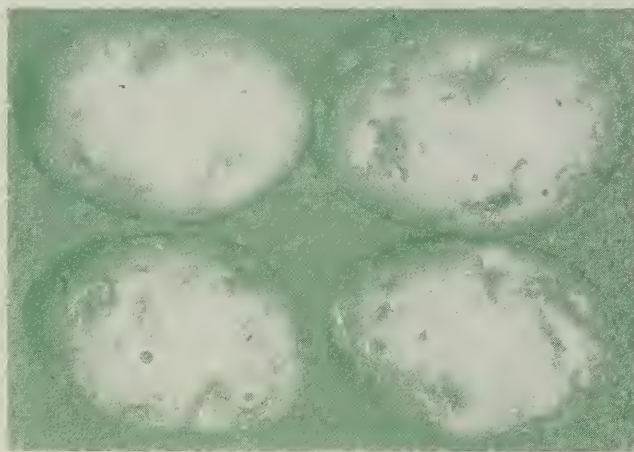
Almost all apples stored at 31° F. were affected by internal browning. But in the lots stored at 40° F. there was no serious browning.

Apples stored in sealed polyethylene-150 liners at 40° F. remained greener in color, firmer in texture, and developed less scald, than those stored at the same temperature in the lighter, 100-gauge film or those stored without film liners.

Some decay showed up in all lots, but there was no indication that storage in sealed film liners increased decay. Oiled wraps reduced scald development in 31° F. storage but had no apparent effect on the amount of scald which occurred in 40° F. storage.

AMS researchers R. E. Hardenburg and H. W. Siegelman, stationed at Beltsville, have found that sealed polyethylene-150 box liners markedly reduced scald and retarded ripening of Rome Beauty, Arkansas, Grimes Golden, and Jonathan apples stored at 31-32° F. The best control of scald was obtained when oil wraps were used in conjunction with the sealed film liners.

RUBBER SCRUBBER ROLLERS CAN INJURE POTATOES



Examples of an unpocked and pocked potatoes.

Are your potatoes suffering from unsightly blemishes? Are their skins bruised and dented by scrubbing? Do they lack "sales" appeal?

If so, here is a message of interest to you.

Agricultural Marketing Service research engineers have found that it's the little rubber fingers (pintles) on the scrubbing rollers that damage the potatoes as they go through the mechanical washing process.

In tests conducted during the winter of 1955-56 at 6 warehouses in the Red River Valley, it was discovered that the harder the roller and the faster its speed of turning, the greater the damage to the potatoes. Also more pockmarks develop after the pintles become worn.

Currently available scrubber material increases in

By Richard S. Claycomb and John C. Hansen

hardness from readings of 40 to 70 on the durometer (the instrument manufacturers use to indicate degree of hardness). Rubber measuring 60 to 70 is the material most widely used in potato washers.

Both new and worn 60-durometer rubber scrubber material pocked test potatoes enough to seriously detract from their appearance. The degree of pocking increased with roller speed and length of time potatoes were exposed to the scrubber rolls.

The 40-durometer rubber scrubber material did not pock potatoes even when they were subjected to high roller speeds for as much as 4 minutes.

The relative cleaning ability of 60-durometer and 40-durometer rubber scrubbers was not determined in these tests. But even in the absence of knowledge of relative efficiency, AMS research engineers make the following recommendations:

*Keep washer roller speed to the slowest r. p. m. that will effectively clean the potatoes.

*Stop the washer when the flow of potatoes stops. Most washers are but partially self emptying and will continue to scrub the trapped potatoes until they are displaced by additional potatoes or until the washer is deliberately cleared.

*When 60-durometer scrubber material wears out, replace it with 40-durometer rubber. Use 40-durometer rubber on all new equipment. If pockmarks are serious, it is suggested that presently used 60-durometer material be replaced with 40-durometer rubber.